CONTENTS OF VOLUME XXII.

NUMBER LXIV.

Page.

Art. I. Notice of Microscopic Forms found in the soundings of the Sea of Kamtschatka—with a plate; by Prof. J. W. Bailey, 1

II. Examination of two Sugars (Panoche and Pine Sugar) from California; by Samuel W. Johnson, - - - - - 6

III. On the Composition of the Muscles in the Animal Series; by MM. Valenciennes and Frémy, - - - - - 9

IV. A Review of the Classification of Crustacea with reference to certain principles of Classification; by James D. Dana, 14

V. On the Mode of testing Building Materials, and an account of the Marble used in the Extension of the United States Capitol; by Professor Joseph Henry, - - - - - 30

VI. On the Occurrence of the Ores of Iron in the Azoic System; by J. D. Whitney, - - - - - 38

VII. Obituary of Professor Zadock Thompson. - - - 44

VIII. On the Influence of the Solar Radiation on the Vital Powers of Plants growing under different Atmospheric Conditions; by J. H. Gladstone, Ph.D., F.R.S., - - - - - 49

IX. Reports of Explorations and Surveys to ascertain the most practicable and economical route for a Railroad from the Mississippi River to the Pacific Ocean, - - - - - 67

X. Five New Mineral Species; by Prof. Charles U. Shepard, 96

XI. Correspondence of M. Jerome Nicklès—Report on the history of the manufacture of Artificial Soda, 99.—Manufacture of Chinese Porcelain, 101.—Peculiar arrangement of a Voltaic Battery: The natural state of Hippuric Acid, 102.—Astronomical news, 103.—Equatorial Telescope: Zenith Telescope: Stereoscopic experiment: Use of brine in food, 104.

SCIENTIFIC INTELLIGENCE.

Chemistry and Physics.—On the production of very high temperatures, 105.—On a new mode of forming ether and its homologues: On the equivalent of antimony: On the detection of phosphorus in cases of poisoning, 107.—Sulphate of nickel: Specific volume of compounds containing nitrogen: On the specific heat of some elements and on the isomeric modifications of selenium, 108.

Geology.—On Earthquakes in California from 1812 to 1855, by J. B. TRASK, 110.—Geographical Discoveries in Africa—Dr. Petermann's Mittheilungen aus Julius Perthes' geographischer Anstalt, 116.—Notices of remains of extinct Reptiles and Fishes, discovered by Dr. F. V. Hayden in the Bad Lands of the Judith River, Nebraska Territory, by JOSEPH LEIDY, M.D., 118.—Notice of a new Fossil Genus belonging to the family Blastoidea, from the Devonian strata near Louisville, Ky., by B. F. SHUMARD, M.D., and L. P. YANDELL, M.D., 120.—Reptilian Remains in the New Red Sandstone of Pennsylvania, by I. LEA, 122.—On the composition of the Water of the Delaware River, by HENRY WURTZ, 124.—On the successive changes of the Temple of Serapis, by Sir CHARLES LYELL, F.R.S., 126.—A Geological Reconnoissance of the State of Tennessee, by JAMES M. SAFFORD, 129.—Fossil Fishes of the Carboniferous Strata of Ohio: Cretaceous Fossils of Nebraska, 133.

Botany and Zoology.—Journal of the Proceedings of the Linnæan Society, London, 134.—Origin of the Embryo in Plants, 135.—Sexual reproduction in Algæ, 136.—Martius: Flora Braziliensis: François André Michaux, 137.—Prof. Wm. H. Harvey: On three new Ferns from California and Oregon, by DANIEL C. EATON: On a new species of Dinornis, 138.—A new species of turkey from Mexico, 139.

Astronomy.—New Planets: Elements of the Planet Lætitia, 140.

Miscellaneous Intelligence.—Ozone, 140.—On Ozone in the Atmosphere, by W. B. ROGERS, 141.—The Tides at Ponape, or Ascension Island of the Pacific Ocean, by L. GULICK, M D., 142.—On a peculiar case of Color Blindness, by J. TYNDALL, F.R.S., 143.—Information to Students visiting Europe, 146.—Geographical Society at Paris, 148.—A Table showing the times of opening and closing of the Mississippi River, by T. S. PARVIN: Chemical Technology or Chemistry in its application to Arts and Manufactures, by Dr. EDMUND RONALDS and Dr. THOMAS RICHARDSON, 149.—Western Academy of Natural Sciences, Cincinnati, O.: American Association for the Advancement of Science: Mantell's Medals of Creation: Transactions of the Connecticut State Agricultural Society, for the year 1855: The Art of Perfumery, and Method of obtaining the Odors of Plants, by G. W. SEPTIMUS PIESSE, 150.—*Obituary.*—Death of Dr. James G. Percival, 150.—The late Dr. John C. Warren, 151.—Daniel Sharpe, Esq., 152.

NUMBER LXV.

Page.

ART. XII. On the Measurement of the Pressure of Fired Gunpowder in its Practical Applications; by WILLIAM E. WOODBRIDGE, M.D., - - - - - - - - - - 153

XIII. Description of the Wax-paper process employed for the Photo-Meteorographic Registrations at the Radcliffe Observatory; by WILLIAM CROOKES, Esq., - - - - - 159

Page.

XIV. On a Zeolitic mineral (allied to Stilbite) from the Isle of Skye, Scotland; by J. W. MALLET, Ph.D., - - - - 179

XV. On the Application of the Mechanical Theory of Heat to the Steam Engine; by R. CLAUSIUS, - - - - - 180

XVI. Statistics of the Flora of the Northern United States; by ASA GRAY, - - - - - - - - - - - 204

XVII. Letter on the Museum of Practical Geology of Great Britain; by Sir RODERICK I. MURCHISON, - - - - 232

XVIII. Remarks on the Genus Tetradium, with Notices of the Species found in Middle Tennessee; by Prof. J. M. SAFFORD, A.M., - - - - - - - - - - - 236

XIX. A new Fossil Shell in the Connecticut River Sandstone; by E. HITCHCOCK, Jr., - - - - - - - - - 239

XX. On the Eruption at Hawaii; by Rev. TITUS COAN, - - 240

XXI. On the Purification of Amorphous Phosphorus; by M. ERNEST NICKLÈS, - - - - - - - - - - 244

XXII. Third Supplement to Dana's Mineralogy; by the Author, 246

XXIII. Correspondence of M. JEROME NICKLÈS—Academy of Sciences—Death of M. Binet: Agricultural Universal Exhibition: Fecula of the Horse-chestnut, 264.—Astronomy: View of a part of the surface of the Moon, 265.—Meteorological System of France, 266.—Inundations: Electricity—Substitute for the copper wire in the construction of Helices, 267.—Effects with Ruhmkorff's Apparatus of Induction: Electric Chronometers: Gas and Steam Manometer Alarm: On a Cause of Atmospheric Electricity, 268.—Bibliography, 269.

SCIENTIFIC INTELLIGENCE.

Chemistry and Physics.—Some experiments in Electro-physiology, by Prof. MATTEUCCI, 270.—Selenium: Iodine, 271.

Mineralogy and Geology.—Meteoric Iron of Thuringia, 271.—Meteoric Iron of Cape of Good Hope: Meteoric Stone of Mezö-Madaras in Siebenburg: On the Volcanoes of Southern Italy, 272.—On the Isthmus of Suez, by M RENAUD, 273.—On the Mines of Mineral Coal in Peru, by M. E. DE RIVERO, 274.—Waters of Lake Ooroomiah, by HENRY WITT, 276.—On the Koh-i-Noor Diamond, 278.—On the origin of Greensand and its formation in the Ocean of the present epoch, by Prof. J. W. BAILEY, 280.—[See also, p. 296.]

Botany and Zoology.—Wild Potatoes in New Mexico and Western Texas, 284.—Notes on Palæozoic Bivalved Entomostraca: Cumæ, 285.—Insecta Maderensia, or Insects of the Maderian Group, by T. VERNON WOLLASTON, M.A., F.R.S.: On the Variation of Species with especial reference to the Insecta, followed by an inquiry into the Nature of Genera, by the same, 286.—On the Fresh water Entomostraca of South America, by JOHN LUBBOCK, Esq., F.Z.S., 289.

Astronomy.—Shooting Stars of August 10, 1856.—Astronomical Observatory at the University of Mississippi, 290.

Miscellaneous Intelligence.—Observations on the climates of California, by GEORGE BARTLETT, 291.—Apparatus for taking specific gravity, by Messrs. ECKFELDT and DUBOIS, 294.—Discovery of Palæozoic Fossils in Eastern Massachusetts, by Professor W. B. ROGERS, 296.—Hailstorm in Guilford County, N. C., 298.—Monks Island or Colombian Guano, by Dr. A. S. PIGGOT, 299.—On the Monks Island Guano, by Dr. A. A. HAYES, 300.—Neo-Macropia: Artificial light for taking photographs, 300.—Waters of the Dead Sea: Density of the Waters of the Caspian Sea, by A. MORITZ: Well in the Desert of Sahara: Composition of the Water of the Delaware River, by HENRY WURTZ: Aluminium: Officers of the Academy of Science for St. Louis, for 1856, 301.—*Obituary.*—Professor John Locke, 301.—Manual of Coal and its Topography, by J. P. LESLEY, 301.—A Treatise on Land Surveying, by Professor W. M. GILLESPIE, A.M.: Annals of the Astronomical Observatory of Harvard College, 302.—Manual of Blowpipe Analysis, for the use of Students, by Prof. WILLIAM ELDERHORST: Notices of new Publications, 303.

NUMBER LXVI.

Page.

ART. XXIV. On American Geological History: Address before the American Association for the Advancement of Science, August, 1855, by JAMES D. DANA, - - - - - - 306

XXV. On the Plan of Development in the Geological History of North America, with a map; by JAMES D. DANA, - - 335

XXVI. Re-determination of the Atomic Weight of Lithium; by Prof. J. W. MALLET, - - - - - - - - - 349

XXVII. On the Relations of the Fossil Fishes of the Sandstone of Connecticut and other Atlantic States to the Liassic and Oolitic Periods; by W. C. REDFIELD, - - - - - 357

XXVIII. On the Application of the Mechanical Theory of Heat to the Steam Engine; by R. CLAUSIUS, - - - - - 364

XXIX. Examination of the Meteoric Iron from Xiquipilco, Mexico; by W. J. TAYLOR, - - - - - - - - - - 374

XXX. On the Heat in the Sun's Rays; by ELISHA FOOTE, - 377

XXXI. Circumstances affecting the Heat of the Sun's Rays; by EUNICE FOOTE, - - - - - - - - - - 382

XXXII. Review of a portion of the Geological Map of the United States and British Provinces by Jules Marcou; by WILLIAM P. BLAKE, - - - - - - - - - - - 383

XXXIII. On New Fossil Corals from North Carolina; by E. EMMONS, - - - - - - - - - - - 389

Page.

XXXIV. Description of an Isopod Crustacean from the Antarctic Seas, with Observations on the New South Shetlands; by James Eights.—With two plates, - - - - - - 391

XXXV. Description of a large Bowlder in the Drift of Amherst, Massachusetts, with parallel striæ upon four sides; by Professor Edward Hitchcock, - - - - - - - - 397

SCIENTIFIC INTELLIGENCE.

Chemistry and Physics.—On the wave lengths of the most refrangible rays of light in the Interference Spectrum, 400.—On the connection between the theorem of the equivalence of heat and work and the relations of permanent gases, 402.—On Ozone: Preparation of Aluminum: On the conversion of carbonic oxyd into formic acid, and on the preparation of formic from oxalic acid, 403.—On the determination of chlorine by titrition, 404.—Reduction of aluminum from cryolite: Researches on the Fluorids, 405.—On two new methods of producing Urea artificially: On Acetylamin: The manufacture of Malleable Iron and Steel without Fuel, 406.—On some Dichromatic Phenomena among Solutions, and the means of representing them, by Dr. Gladstone, 412.—On several new methods of detecting Strychnia and Brucia, by T. Horsley, 413.

Geology.—On the Spongeous Origin of the Siliceous Bodies of the Chalk Formation, by J. S. Bowerbank: On some Palæozoic Star fishes, compared with Living Forms, by J. W. Salter, 415.—On the Physical Structure of the Earth, by Prof. Hennessy, 416.—On the Great Pterygotus (Seraphim) of Scotland and other Species, by J. W. Salter, 417.—On the Bone Beds of the Upper Ludlow Rock, and the base of the Old Red Sandstone, by Sir R. I. Murchison, 418.—On a Fossil Mammal (Stereognathus ooliticus) from the Stonesfield Slate, by Prof. Owen, 419.—On the Dichodon cuspidatus, from the Upper Eocene of the Isle of Wight and Hordwell, Hants, by Prof. Owen, 420.—On a range of Volcanic Islets to the Southeast of Japan, by A. G. Findlay, 421.—On the New Red Sandstone Formation of Pennsylvania, by Isaac Lea, 422.—Descriptions of New Species of Acephala and Gasteropoda, from the Tertiary formations of Nebraska Territory, with some general remarks on the Geology of the country about the sources of the Missouri River, by F. B. Meek and F. V. Hayden, M. D., 423.

Botany and Zoology.—Alph. DeCandolle: Géographie Botanique raisonnée, ou Exposition des Faites principaux et des Lois concernant la Distribution Géographique des Plantes de l'Epoque Actuelle, 429.—Origin of the Embryo in Plants, 432.—Bentham, Notes on Loganiaceæ, 433.—The Flowers of the Pea-Nut, 435.—Martius, Flora Brasiliensis: L. R. Tulasne, Monographia Monimiacearum, 436.—Chloris Andina, Essai d'une Flore de la Region Alpine des Cordillères de l'Amerique du Sud, par H. A. Weddell, M.D.: Manual of the Botany of the Northern United States, by Prof. Asa Gray, 437.—Report on the present state of our knowledge of the Mollusca of California, by Rev. P. Carpenter, 438.—On the Vital Powers of the Spongiadæ, by Mr. Bowerbank, 439.—Gar-pikes, 440.

Astronomy.—New Planets, Harmonia, 440.—Daphne: Isis, 441.

Miscellaneous Intelligence.—American Association for the Advancement of Science, 441.—The Meteor of July 8th, by W. Spillman, 448.—Sulphuric Acid Barometer: Cantonite: British Association: American Geological History, 449.—*Obituary.*—Rev. Dr. Buckland, 449.—Geology of the Pacific and other regions visited by the U. S. Exploring Expedition under C. Wilkes, U. S. N., in the years 1838-1842, by James D. Dana:

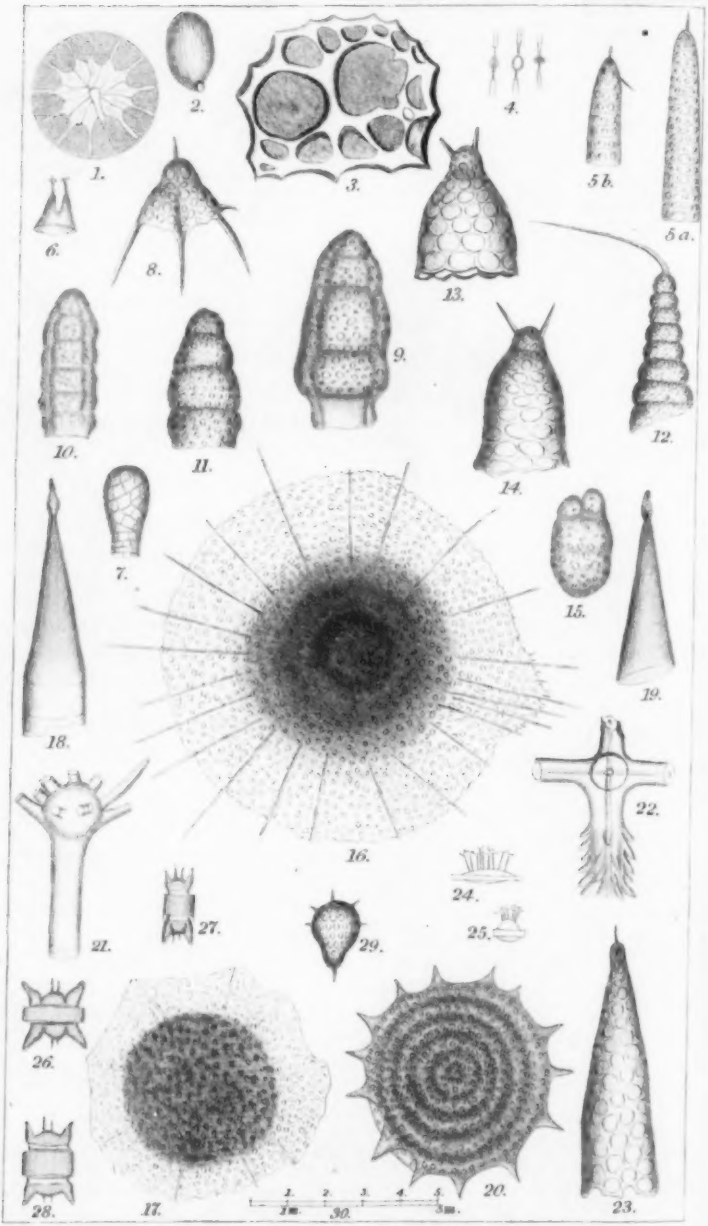
A Chronological Table of Cyclonic Hurricanes, by ANDRES POEY, 452.—Description of some Remains of Fishes from the Carboniferous and Devonian Formations of the United States, by JOSEPH LEIDY: The Quarterly Journal of Pure and Applied Mathematics, edited by J. J. SYLVESTER, M.A., F.R.S.: Fossils of South Carolina, by M. TUOMEY and F. S. HOLMES: Abhandlungen der Kaiserlich-Königlichen Geologische Reichsanstalt, 453.—Geognostiche Darstellung der Steinkohlen-formation in Sachsen mit besonderer Berücksichtigung der Rothliegenden, von HANNS BRUNO GEINITZ: Das Normal Verhältniss der chemischen und morphologischen Proportionen, von ADOLF ZEISING, 154.—Principles of Chemistry, by Prof. JOHN A. PORTER, M.A., M.D., 455.

List of Works, 455.

Index, 456.

ERRATA.

P. 1, line 2 from bottom, for *Dictyopyxis *read* Dictyopyxis; l. 4 from bottom, for Dicladia, *read* *Dicladia: p. 2, lines 1 and 2 from top, for *Coscinodiscus, *read* Coscinodiscus; l. 2 from top, for Rhizosolenia, *read* *Rhizosolenia; l. 5 from top, for Difflugia, *read* *Difflugia; l. 16 from top, for Eucyrtidium, *read* *Eucyrtidium, in both cases.



MICROSCOPIC FORMS found in the SEA of KAMTSCHATKA.